a female in general appearance as its brood sisters. Several skilled poultrymen, when shown the bird, have unhesitatingly pronounced it a pullet.

Aside from a perfectly clear record, the marks of the operation, which are still visible, show that the bird when operated on must have been a male.

While possible that this particular individual may owe its feminized character to a constitutional condition, such as hen feathering, such an assumption is extremely improbable. Rather, it seems more probable that the bird has actually been feminized by the implanted ovaries in similar fashion to the rats and guinea-pigs of Steinach.

A full account of the bird will be published after it has been under observation for several months.

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A THIRD ORDER RAINBOW

TO THE EDITOR OF SCIENCE: On September 11, as I stood near the lake in Beardsley Park, Bridgeport, Conn., I observed a rainbow in such an unusual position that it seems to be worthy of some short description. The rainbow was first noticed about a quarter of five in the afternoon, with the sun perhaps 60° from the zenith. The sky in general was clear, though there were heavy clouds above the eastern horizon and very light cloud streaks between the observer and the sun, with a few fleecy clouds near the zenith. No rain was falling, and probably none had fallen in the region for some time, nor was there indication that any would fall for hours; yet, between the observer and the sun, some 10° from the zenith, there appeared between two of the clouds a distinct rainbow, clearly observed by others whose attention was called to the phenomenon.

The bow was rather short, not over an eighth of a circumference, convex toward the sun, and showed plainly the usual rainbow colors. Not until the bow had faded to such an extent that the colors were no longer marked was it recalled that no accurate statement of the order of colors could be given. It is my impression now that the red was on the convex side.

Wood's "Physical Optics," second edition, p. 343, gives for the deviation produced by K internal reflections in a sphere

$$D = 2(i - r) + k(\pi - 2r)$$

and for minimum deviation,

$$\cos i = \sqrt{\frac{\mu^2 - 1}{K^2 + 2K}}.$$

For $K = 3$, this gives

$$i = 76° 50,$$
$$r = 46° 55',$$
$$D = 318° 20',$$

whence the angle between the emergent and incident light would be about 42°. This would agree fairly well with the rough estimate of 50°. Hence the conclusion that the rainbow observed was the result of three internal reflections within suspended drops of such small size and number as to give no appearance of a cloud.

Various authorities, however, state with more or less emphasis that the bows corresponding to three reflections are never seen on account of the much more intense direct light from the sun. In the case cited above it would seem that the light clouds directly between the observer and the sun served to diminish the intensity of the direct light to such an extent that the bow was plainly seen.

This seems to be the only explanation for the bow, but considering the very light clouds noted above, the observation is all the more remarkable.

H. W. FARWELL

A SOLAR HALO IN VIRGINIA

THE solar halo, a sketch of which is appended, was visible over a considerable portion of east Virginia for several hours on Sunday, November 2, 1913. It was observed by the writer at Fredericksburg, Virginia, at one P.M. on that day. The phenomenon was of the greatest brilliancy, the acessory "suns" being at times almost as brilliant as the sun itself. The great circles around the horizon were dis-